Tradable Permits for water management:
Conceptual framework

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Structure of presentation

• Background and scope
• Typology of economic instruments in water management
• Focus on the role of tradable permits (TPs)
• International experience with water pollution
• TPs (empirical cases) and lessons learned
• Application of TPs in water pollution
• Strategies for introduction, opportunities and limitations, instrument mixes
• Conclusions

Background and scope

• Move from command-and-control to market instruments to reduce water pollution
• Tradable discharge permits: a most challenging market instrument with limited experience
• Scope of presentation:
  • empirical basis + conceptual framework for the application of TPs in water pollution
  • specificity of water pollution (consideration of institutional issues, besides law and economics)
  • no in-depth analysis of the overall design and national implementation of TPs (see extensive OECD work)

Tradable permits (TPs): General

• Used for the allocation of shared resources among users
• Three different fields of application:
  • tradable water abstraction permits
  • tradable permits to water-borne resources
  • tradable water pollution permits (subject of this presentation)

Tradable permits for water abstraction

• Often used for re-allocation of water rights
• Trading can be permanent, temporary (seasonal) or even one-off
• Application so far mainly in Chile, US & Australia (some experience in Spain, Mexico)
• Application mainly within the agricultural sector (but inter-sectoral transfers are promising)
 Tradable permits to water-based resources

- Applied to the use or consumption of water-borne resources, e.g. fish, energy of water
- Many interesting cases (e.g. case of salmon fisheries and exclusive fishing rights in Scotland)
- Trading may work, as long as there are no significant externalities (impacts on, or from, other water uses or functions)

 Tradable permits for water pollution

- Much higher degree of complexity than trading water abstraction rights
  - large number of pollutants with potential synergetic effects
  - precise location of discharges determines the environmental consequences
- Some practical experience in US, Australia
- EU provides "in theory" for trading in P and N emissions (Urban Waste Water Treatment Dir.); no use of this provision made so far

International experience I

- Evaluation of 8 empirical cases from the US and Australia
- Three categories of trading according to polluting substances:
  - Salinity trading
  - Organic pollution trading
  - Nutrient pollution trading
- No detailed presentation of each case study, please refer to draft paper

International experience II

<table>
<thead>
<tr>
<th>Salinity</th>
<th>Murray-Darling (AUS)</th>
<th>1 parameter, end-of-reach salinity target (at 1 point), rights exchanged between States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hunter River (AUS)</td>
<td>1 parameter, 1 salinity target (at 2 points), real-time data/continuous monitoring</td>
<td></td>
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<tr>
<td>Organic</td>
<td>Fox River (US)</td>
<td>Few participants, trade unattractive due to low gains</td>
</tr>
<tr>
<td>Nutrient</td>
<td>Hawkesbury-Narwean (AUS)</td>
<td>Bubble of 3 point sources, strong regulatory framework</td>
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<tr>
<td>Far-Pamlico (US)</td>
<td>Basin-bubble for 14 point sources, transactions with non-point through a non-point source fund</td>
<td></td>
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<tr>
<td>Lake Dillon (US)</td>
<td>Phosphorus bubble for the lake, trade non-point – point at a ratio 2:1, co-operative management</td>
<td></td>
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<tr>
<td>Cherry Creek (US)</td>
<td>Phosphorus standard and TMDL for the reservoir, trade of non-point – point allowed</td>
<td></td>
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<tr>
<td>Chesapeake Bay (US)</td>
<td>Cap for Bay, Nutrient Trading Negotiation agreed guidelines for States, voluntary basis</td>
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</tbody>
</table>

Lessons learned I

- Experience with trading should be considered in the context and pre-existing conditions (US, AUS had prior functional regulation)
- Trading effectively applied for single chemical or physical parameters (nutrients, P or N, are traded as single substances)

Lessons learned II

- Salinity: continuous analysis possible, easy to monitor market participants
- Organic pollution (Fox River): lack of understanding of abatement and its costs
- Nutrient pollution:
  - success with bubbles over point sources
  - strong pre-existing regulation as a framework
  - growing interest in trade between point and non-point (but uncertainty in estimation and monitoring of non-point, complex array of issues)
### Strategies for introducing TPs I

- Value of an existing functioning system (command-and-control or other market-based) for pollution control prior to trade
  - trading benefits from pre-existing monitoring and enforcement
- Value of a pilot phase to explore and test all scheme elements

### Strategies for introducing TPs II

- Shift from technology pollution controls to controls on emission
- Ensure effective control on quantity and quality of effluents
- Define tradable rights
- Establish a cap
- Establish a mechanism for the allocation of tradable rights

### Strategies for introducing TPs III

- Involve sufficient number of potential buyers and sellers
- Give room to "fine-tune" the allocation and trading rules / periodic evaluation to be able to respond to new challenges
- But avoid too frequent revision of rules that jeopardise investments made
- Clarify "ground rules" between trading and regulatory limits

### Some factors favouring trading

- Assurance and acceptance of trading rights and rules (legal establishment or other stable framework)
- Monitoring and reliable data
- Thorough pilot phase/consultation
- Good scientific understanding of the pollution factors and the catchment
- Obvious market advantage from trading

### Some factors impeding trading

- Ineffective administration and long approval process
- Uncertain legal viability of rights
- Creation of pollution hot spots due to trade
- Trading only in restricted geographical zones (e.g. sub-river basins), which may lead to a "small market"

### Compatibility of TPs with other instruments

- Taxes and charges
  - may encourage to sell "sleeping" water rights
  - mutually reinforcing with tradable permits
- Environmental quality objectives (EQOs)
  - equivalent to "bubbles"
  - may be prerequisite to tradable permits
- Technology-derived standards (BAT)
  - limited compatibility with tradable permits
Compatibility of TPs with other instruments

- Principles of environmental policy
  - TPs compatible with polluter-pays, resource-user-pays, prevention principle
  - Weak compatibility with pollution-reduction-at-source
- Overall compatibility in instrument mixes
  - TPs compatible with most existing instruments and can be part of an instrument mix
  - But TPs are more demanding in terms of enforcement and monitoring than other instruments

Conclusions I

- Legal framework secures trading scheme but should be linked to practical realities of the country/region (existing infrastructure and context)
- Well-designed monitoring and enforcement should be in place
- So far, few markets for water pollution, still experimental

Conclusions II

- Functioning schemes built on traditional environmental management systems and strong (pre-existing) regulatory regimes
- Examples from the US and Australia
  - Advanced economies with pre-existing regulation for pollution control, monitoring, enforcement
  - Federal countries providing flexibility for innovative instruments in individual States
- Pilot phase in certain regions prior to nation-wide application is advisable

Selection of relevant studies


Thank you for listening.

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